THE UNIVERSITY REVIEW

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of the UNIVERSITY OF KANSAS CITY

(Successor to *The University Bulletin*)

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The University Review

A JOURNAL *of the* UNIVERSITY OF KANSAS CITY

Lady of Mercy

HENRY C. HASKELL

Reflections on the life of Dr. Katharine Berry Richardson, Founder of Mercy Hospital.

IT is now not yet two years since Dr. Katharine Berry Richardson died in her room at Nurse Hall, but already she tends to become a legendary figure in the community where she spent the greater part of a long and active life. There is nothing strange about this translation in Dr. Richardson's case, except for the speed with which it seems to be taking place. The doctor died almost literally, as the saying goes, in the saddle. She continued to operate until only a few days before her death, and the enforced retirement from her work at Mercy Hospital, which was perhaps the one thing that Dr. Richardson had ever feared in her life, never overtook her. But although her personal service ended so recently and her influence persists in organic form through the hospital she founded, it is as if the woman, herself, had been much longer dead.

Dr. Richardson sometimes suspected that that woman had never lived. As far as the community at large is concerned, I believe she was probably right. "People," she once said to me, "seem to think I have no personal life." And, again, "If I had my life to live over, I should manage it differently; I should be very frivolous." The words were spoken without bitterness. They did not reflect, I am sure, any feeling that her life had been wasted, only a late conviction that she had missed something — something she called frivolity but which represented to her not simply a desire for trivial entertainment. To Dr. Richardson the word stood for a certain type of human relationship of which she believed herself incapable and which she conceived to be founded upon a capacity for pleasure that her way of life had denied.

In her last years Dr. Richardson was a lonely woman. Her husband had died long ago; her sister, a few years later. And although she commanded great respect in the community, she had few friends. I think it was only toward the end of her life that she became conscious of her loneliness. Before that she probably was too busy to notice it. The doctor was endowed with superhuman energy and a character that compelled her to exhaust it in the service of society. Her achievements, I believe,

were fully comparable to those of Florence Nightingale, with one significant difference. For whereas Miss Nightingale defied the prejudice against women in professional life, to reform the medical service of the British army, she had behind her the enormous pressure of family influence. The prime minister under whose administration she accomplished so much was her personal friend. Dr. Richardson encountered the same prejudice in this country, but she had no influence to help her.

As a girl, the doctor ran away from home to study medicine. Fifty years ago that was a procedure which called for daring, a daring that amounted to audacity in the case of a well-bred Southern girl. And even much more recently, when in recognition for her extraordinary skill in facial surgery Dr. Richardson was elected a fellow of the American College of Surgeons, this honor was still deemed remarkable for a woman. Incidentally, that fact constituted its chief value to her; for in the doctor's mind it was not so much a personal award, as another blow at what she considered the stupidity and injustice of the world's attitude toward the achievements of women.

In the face of a general unwillingness to employ a woman physician, Dr. Richardson not only undertook the practice of medicine in Kansas City but with the assistance of her sister, Dr. Alice Graham, she started a free children's hospital, having at first only a single bed in the house where they were living. It was characteristic of the doctor that she invariably gave her sister the entire credit. But certainly Mercy Hospital, as we know it today, is almost solely her creation. Without capital of her own and refusing any return for her services, she built it up into one of the most important institutions of its kind in the country. Not only did she manage the hospital and head its surgical staff, but by means of a correspondence that would have provided in itself a full-time occupation for many persons she raised funds for its enlargement, as well as for its regular maintenance. And at the same time she supported herself for the last twenty-five years of her life by what little private practice she was able to conduct in her spare moments.

The magnitude of this accomplishment is obvious. But as if to show her energies had no limit, the doctor also found time for other activities, including, notably, the advancement of Negro health. Thus it came about that even in her lifetime her fellow citizens were inclined to regard Dr. Richardson with awe and to assume, naturally enough, that she had no time for ordinary social contacts. Hers, it was felt, was one of those heroic natures that neither desired nor needed human companionship. She said, "They appear to think I am simply an institution." In her earlier years the doctor must have fostered this idea by declining invitations. At least in her later life the result was that she was rarely invited anywhere. About three years before her death, when she had long been acknowledged the outstanding woman of the city, she attended a reception. "I can't stay," she said, "but I did want to come for a minute, because this is the first reception to which I have ever been invited."

In those last years the prospect of a holiday became a kind of nightmare to

Dr. Richardson. Thanksgiving and Christmas were two that she particularly dreaded. She had no relatives with whom she might spend them. There was no operating to be done at the hospital that would occupy her time. She once confessed that sitting home alone on Christmas, she almost became hysterical. It was this kind of experience, I think, that made her terrified at retirement. "Never tell anyone your age," she said. "If you do, they will begin to talk of retiring you." And so the doctor never told her age, but she must have been nearing seventy at the time. That her time for social engagements was restricted cannot be denied. It was a profound mistake, however, to suppose, as most persons did, that she had no liking for them. "Ask me," she used to say. "I may not be able to come this time, but keep right on asking me."

Being disposed to believe that her loneliness arose from a fault in her own character, Dr. Richardson carefully cultivated little social arts, to make her company more agreeable. She felt keenly what she considered her lack of conversational resource. "Please don't mind if I don't talk very much," she would say apologetically. "Just let me sit and listen." But she could speak interestingly on many subjects. She read as widely as her limited library allowed. "Some of the books I have read so often," the doctor remarked, "that I always know what the next word will be." And she developed hobbies that she also could discuss, such as the making of period furniture and a knowledge of basket weaving. She could almost never be induced to talk about her own life, although one evening about three weeks before her death, being "out in company" I believe for the last time, she did speak at some length and very entertainingly of her girlhood in Kentucky, particularly of a horse that her father had given her.

Dr. Richardson's greatest defect as a conversationalist from the point of view of many persons probably was her frankness. She was direct to the point of bluntness. She hated insincerity, pretentiousness and sentimentalism, and she was no respecter of persons. As a result, she often gave offense, especially to those who, conscious of their good intent, felt that she did not properly appreciate their efforts on her behalf. Persons who do the least for a cause usually expect the most credit. The doctor did not give it to them, and they resented her attitude, forgetting that she took no credit for herself. Indeed, she accepted help, as she gave it—as a matter of course. And the well-meaning woman who donated a broken doll to Mercy Hospital and then proceeded to sentimentalize about the "dear little sufferers" never repeated her indiscretion.

There was one thing that Dr. Richardson detested even more than sentimentality; that was the detached efficiency of the professional social worker. She declined absolutely to permit such an attitude to enter Mercy Hospital. "Our children," she said, "are not cases, to be numbered and catalogued. They are human beings, and as long as I live, they shall be treated as such." Her respect for the individual knew no bounds. It extended throughout her relations not only with thousands of children but also with her nurses. It

led her to denounce in no diplomatic terms the practice of giving worn-out toys to her small patients at Christmas time. It caused her to furnish each room in Nurse Hall differently, so that the nurses, particularly the young students, would not be oppressed by a feeling of uniformity, and to provide them with small sitting rooms, where they might meet their friends in some degree of privacy. It was perhaps the supreme paradox of Dr. Richardson's life that this woman who was regarded by her community as an institution was one of the most unrelenting enemies of institutionalism who has ever lived.

The legend that already had started to grow up about Dr. Richardson even in her lifetime is of a woman, stern and enormously efficient, intolerant of opposition, wholly sufficient unto herself—in short, a woman of great abilities but one who left her fellows feeling slightly uncomfortable and more than a little inferior. There are elements of truth in this legend, as there are in all legends, but they are not the essential truth about Dr. Richardson. Those few persons who were privileged really to know her are aware how different she was from the popular conception of her, how great was her capacity for friendship, how considerate and modest she was in her primary human relationships, how completely unselfish she was, how unsparing of her time and energy and yet how profoundly she regretted the loss of a normal life that her career had entailed. My own strongest impression of Dr. Richardson is of one afternoon when she carried a certain baby girl about the hospital in her arms for an hour, playing with it and talking to it as if it were her own. "It is so good," she said, "to see a well child." I sometimes think no community ever fully realizes the human sacrifice that its service demands.

Sonnet

ANONYMOUS

Oh, I am free forever of not-loving.
Death has left my shoulders, for I love,
And life at last has broken from above
The sleep that has been long in its removing.
Chaliced under heaven did I lie,
Smothered beneath the mist and torturing gray
Of earth-things flung to fascinating spray
About my slumbrous head. The old mauve sky
Curved down to shut me in with all these things,
And hide from me, Love, Love and Thee. Then from
My place in their midst I knew that you had come,
For they all differently stirred—dawn brings
Not such a change; their colors broke
Into tremendous white, and I awoke.

Missouri's Archaeological Resources

J. E. WRENCH

Discoveries in the ancient civilizations of Missouri.

THE search for the remains of man's handiwork in the remote past is one of the major phenomena of modern scientific investigation. The thrill of the discovery of the Altamira bison or the treasures of the tomb of Tutankhamen stirred even the fashion designers of the modern world, to say nothing of the vista of concrete knowledge that was opened. The cliff dwellings of our own southwest, and the Aztec and Maya remains of Mexico and Central America increasingly attract the sightseer as well as the archaeologist. The extensive mound fields of Ohio and Wisconsin, already exploited for their archaeological material and scenic value, are annually visited by thousands of tourists. The fame and spectacular character of these remains tend to obscure the fact that within the state of Missouri lie remains of perhaps as significant scientific value as any of these more widely advertised finds.

In historic times Missouri is known as a "border state" with all the implications and problems that such a condition develops. Apparently in the ages that preceded the European's advent a similar condition obtained. Then, as in its early recorded history, the Mississippi was both a highway and a boundary. The rugged contours of the Ozarks interrupt the sweep of the vast central plains. The alluvial plain of the Mississippi in the extreme southeast of the state formed an entirely distinct area. Still earlier the ice sheet stopped about midway of the state. All these physical features had an influence on the type of culture and occupation of primitive peoples, even greater than they have today.

Several types of identified cultures can already be definitely located in the state. Earliest in point of time apparently is that of the "Bluff Dwellers" in the extreme southwest where the remains of a primitive people who knew not the bow and arrow are to be found in the caves and rock shelters of the bluffs of MacDonald and adjoining counties with still more abundant remains in northern Arkansas. In Jacob's Cavern near Pineville was discovered the bit of bone with the carving of what may be identified with the mammoth, now on display in the Capital Museum at Jefferson City. In the extreme northwest, deeply imbedded in the loess, are traces of a culture with distinctly Central American characteristics which has been studied in some detail by the excavations at Sterns Creek in Nebraska. Along the northern border are probably examples—they have not yet been verified—of the effigy mounds similar to those found in Iowa and particularly in Wisconsin.

In the alluvial plain of the southeast are numerous mounds belonging apparently to the Hopewell culture as evidenced by the famous copper plates from Malden now in the Jefferson Memorial Museum, St. Louis. Some idea

of the civilizations of this area is to be inferred from the excavations just across the river at Wickliffe, Kentucky, and the results of the St. Louis Academy of Science Campaign in 1878. On the banks of the old Mississippi has been found a site giving evidence of occupation by four different culture groups. Throughout the southern part of the state and especially along the northern edge of the alluvium are to be found the "house mounds," sometimes by the hundreds. In an area of about eighty square miles near Advance in Scott county there are several thousand, "the largest group of mounds in the United States." Both north and south of the Missouri are burial mounds covering walled graves of a distinctive type. In investigating somewhat carefully the occupied sites in Boone County, three distinct types of occupation have been identified.

No remains of a particularly spectacular character seem to be present in Missouri with the exception of some of the larger mounds in the southeast, the circles in Lawrence and Dade counties, and the old fort in Saline county. Some years ago the investigator for Louis Houck found a number of sites in the southeast with outlines like those in Ohio, but cultivation has either obliterated them altogether or so worn them down that they are barely distinguishable. In the extreme northern part of the state in the basins of the Chariton and the Grand seem to be similar remains. On the bluffs along many of the streams are burial mounds, some in considerable series, others isolated or in twos and threes. Many of these have suffered from the ravage of amateur collectors and curiosity seekers so that their scientific value is ruined. Unless a concentrated effort is made very soon, what little that remains will be gone forever.

The problems connected with the study of these remains for the determination of the character and the age of the cultures mentioned above are exceedingly difficult but it should seem abundantly clear that excavations in Missouri on sites which were occupied by two or more of these cultures will establish their respective ages and their relationship. Such stratified sites are already known, and merely await the necessary funds for their excavation. Not much really scientific study of remains in Missouri has yet been carried out. The Long expedition in 1819 excavated some mounds in the immediate neighborhood of St. Louis. Squier and Davis in 1847 published the results of some excavations in the Mississippi valley. Of more modern scientific value was the work of the St. Louis Academy of Science, the results of whose excavations in Southeast Missouri were published by the Academy in 1878. Shortly after this the Smithsonian Institute published the results of excavations made at various points from Clark county south to Stoddard. Early in the twentieth century Jacob's Cavern was partially excavated by Mr. Moorehead of the Phillips Academy, the first really modern excavation. Local archaeologists and scientists connected with the various educational institutions of the state have dug into many of the remains and published occasional accounts in various periodicals. Too often the results have been placed in museums without proper marking or in many cases whole collec-

tions have been sold outside the state to dealers and are lost forever.

In February, 1934, at the suggestion of Professor J. Brewton Berry an opportunity was given under the C. W. A. for the beginning of an archaeological survey of the state similar to what has been done in Ohio and Michigan and is now in progress in other states, including Iowa, Nebraska and Arkansas. In August Professors Berry and Wrench of the University were enabled to set up a project under the State Relief and Reconstruction Commission in which investigators were appointed in seventy counties in the state. During the two months it continued, nearly three thousand sites — villages, mounds, caves, rock shelters, workshops, trails, etc.— were located. Under a subsequent project these were located on base maps, while all the previously published material was collected and assembled for use. In December a State Archaeological Society, with headquarters at Columbia, and open to membership to any resident of the State, was formed to aid in prosecuting the work.

At present the work is perforce of an exploratory nature to locate the sites of ancient occupation, and to determine, if possible, those which will yield the best results in excavation. Of equal importance is the task of instilling a genuine scientific interest in and respect for these remains in order that we may preserve as far as possible what are left. Missouri possesses in these remains a unique scientific asset which may also turn out to have a valuable intrinsic interest and it is to be hoped that steps will be taken to preserve the evidences of long forgotten civilizations.

Shadows

DORIS SOWERS

The sun all down its westward course
Left warm the sky with dull, red gleams
That lingered on. While through the silence of the dusk,
Dropping down soft, warm, and hushed
As wakeful dreams, blue shadows, lengthening, lengthening, still,
Crept down from the darkening hills—
Blue shadows left the purple hills.

The sky with its vermilion stain
Had faded while the daylight waned
And came the night. Now trees against its murky bed
Tired leaned their sighing heads,
While puffs of clouds like purple blooms
Brushed soft across the arc of moon—
Purple shadows kissed the moon.

Joey Bean Grows Old

DORIS GRIFFITHS

TO the little gray man with the shiny rifle and the bloody game bag, half full at the day's end, the village of Pontoosuc on this snowy March evening presented a quiet and peaceful picture. From his position on the rise, facing the town, it looked like a rope of dim lights spread along the snowy country road. In the gray white dusk the house lamps seemed like cool, distant stars, and the carlights, bumping along the pitted old oil road, quivered in the distance. In front of the old store building the street lights blinked vacantly, and at his left the signals of the squat red depot glimmered on stiff white fields and naked woods, stretching to the horizon, where scattered farm lights gleamed.

The old man's gaze came back to the shabby old store building where he had eked out a sustenance for so many years. The boarded-up windows and the sagging sign, which rain and wind had cleared of all suspicion of paint, leered at him in mockery. Youth, vigor, old age—what? The words which Sam Keeler had said only yesterday evening came back to him with stabbing clearness:

"Closin' up, Joey. Can't make it. Yu ain't got the modern business ways somehow, and yer lettin' old John Hicks git the better of you. Gotta have a little pep in business nowadays."

Sam Keeler owned the store where Joey had worked for—thirty years? Forty? It must have been forty, anyway. In those first days Sarah Bean, his wife, had not been round and bulky and ailing. She had been a rather tall, buxom woman, with thick brown hair and red lips. He hadn't been stooped and tired, then, but short, straight, and dapper—rather handsome, some had said. Now at times it seemed he was so cranky that he couldn't get along with anybody—not with Sam, nor with Sarah, nor with the heathenish small boys who pestered him, nor with John Hicks, the rival storekeeper of the town. It hadn't always been that way. He smiled tremulously as he thought of the old times.

In the autumns the school children had flocked in, in dusty chattering groups, and perched on the counters to drink cold pop or munch bright apples while they gabbed and giggled over the slogans on the oatmeal boxes and the "strictly cash" sign over the door. He had watched many a flirtation over the friendly bottles, and many a childish quarrel, too.

In the crisp evenings about the old black stove, the men and boys would sit, perched back in stout chairs, and argue heatedly over the merits of the cows Ed Green had bought or Tom Jones's new wagon. Sometimes two or three town urchins would sit there, full of worldly importance and wisdom; sometimes Silas Newton, the town's most proficient tobacco juice spitter, or Oran Taylor, an awkward young swain just out of High School. Sometimes they sat in silence, just soaking up the heat of the glowing

stove, until, roused by the contented squeak of a mouse or the falling of a log, desultory talk would flare up, dwindle, and die out.

As Joey Bean trudged down the slope and across the icy tracks he saw the evening train come over a distant hill, slide down the slick rails with a rhythmic click, and rush past with a roar and a sweep of cold wind. It squeaked to a stop in front of the depot, threw off the mail sack and a half dozen cream cans; then with a deep-throated grunt, it was again on its way.

"Spect I'd better get the mail," Joey said, half aloud, and turned his steps toward the brightly lighted building which served as post office, dry goods store, grocery, and gas station of the town. Now that Sam had fired him, there wouldn't be any competition. Old John Hicks could be happy now. He had surely tried hard enough to drive Joey out of business. In the lean years, when Joey had kept Sam's store going by his perseverance and generosity, old John had fought him every step of the way. He had driven down the prices, stolen the meat trade, forced the rent up, everything which a powerful and unscrupulous man could do. And John Hicks had won.

Joey slung the pack wearily across his shoulder and trudged on. It was only last night that Sam had come to him and broken the cruel news.

"Closin' up, Joey. Can't make it." Those had been his first words. "Yu ain't got the modern business ways somehow, and yer lettin' old John Hicks git the better of you. Gotta have a little pep in business nowadays."

In answer, Joey had faltered, "I'm doin' the best I can, Sam. Times ain't what they used to be, and you know I ain't had no pay since two years ago, only what groceries I got from the store. My wife ain't—"

"Only groceries!" Sam stormed. "You measly old two-by-four! You been livin' off the store for years. No wonder it went under. You been livin' high while I been starvin' myself to get a good home and education fer my kids. You got all yer gonna get outa this store. You ain't never goin' to get no wages. Yer too old fer any good, Joey. You jist ruin't my good store trade."

There had been much more to the same effect. Abuse, recriminations, contempt. It was awful! When had he had any money? For years, it seemed, he had been loaning the store his wages so they might keep going. Now, not a cent. Did it mean the poor house? A cold thrust of terror came over him. Sarah couldn't stand that. But what could he do? It wouldn't have been so bad if Sam hadn't said that about his being too old. Was he really too old to do anything? He shivered.

Joey had reached the slick sidewalk now, and as he came up to old John's store, a feeling of dread came over him. Always, he had hated to come here for his mail. Now it seemed almost as if he couldn't do it. All the loungers, the clerks, old John himself, would have heard his misfortune by this time. He would be the talk of the town, the target of everybody's pitying or contemptuous eyes.

As Joey entered the busy store, the talk subsided into halting, stilted murmur. The men about the stove and the

urchins on the stools stared covertly. Silas Newton aimed a long one at the smeary cuspidore, missed it, and drawled,

"Good shootin' today, Joey?"

"Oh, jist purty good, jist purty good."

"Purty good trackin' over in Pete's pasture?"

"Yep, purty good, purty good."

He felt everyone's eyes boring into him, knew that they were wondering, speculating, as to why the store was closed today. Probably it would be all over town tomorrow. Maybe it already was. He got his mail and a loaf of bread; then slunk hesitantly out into the cold streets. Oh, if he didn't have to tell Sarah! She wouldn't understand. She hadn't wanted him to put his money into the store without a regular agreement. She hadn't wanted him to wait for his wages. Well, she had been right and he had been wrong. He might as well face it.

Sarah didn't say I told you so. Instead, she scolded him mildly for getting his feet wet; then brought his house slippers and an old sweater to prevent chilling after the long day in the cold.

Presently she said cheerfully, "You'll get something else soon, so don't worry, Joseph," but when she tried to set the table for supper a dish slipped with a crash to the floor.

Supper was a pallid affair. Joey spilled his tea and it had to be sopped up; Sarah cut her finger and it bled inordinately; even the cat stepped in its pan of milk and tracked it over the rug.

After supper Sarah cleared the table and Joey again sat down by the fire to read and listen to the radio. The music was good and he should have enjoyed it, but a heavy beat in his breast kept time with the thumping of the drums in an unconscious refrain, "Old, old, old, old." Finally he rose and said querulously, "I guess I'll go to bed; I'm kinda tired."

In bed he lay with his eyelids pressed down tightly, counting sheep. Soon he was counting money, counting jobs, counting years, until finally he fell into a troubled sleep, to dream of dancing and wealth and horrible beasts, and a heavy drum beat singing, "Old, old, old, old."

At gray dawn he woke, but turned over wearily at the thought of no work, and slept again, fitfully. Later, he got up, built the fires, carried in the wood, and wiped the dishes. By noon he was so restless that he went out in search of work.

As he dragged wearily down the snowy road, he mulled over the things he could do. He could tend furnaces, mow lawns in summer, sweep sidewalks, paint, clean, do little odd jobs which the small boys usually did. His slight body was not fit for heavy work. It was fit for nothing but keeping store. He came home at dusk, after walking for miles without asking anyone for work.

Sarah looked up inquiringly when he came in, but said, after a moment, "Mary Carson has the measles. I spose they'll all take it now."

For a week Joey tramped about the snowy country side, or sat brooding by the fire, always avoiding his old friends or the neighbors' curious glances with averted face and downcast eyes.

Then suddenly one day, spring came. As Joey walked downtown, he noticed a commotion in front of his old store. Men were carrying out boxes, benches, and counters. There lay the old black stove and there the glass candy counter. Then Sam really was broke and the sheriff was moving him out. At least Sam had been honest in that. They were making way for someone else. Joey leaned against a post and watched them with tired, hurt eyes.

What a muddle nature was in, too. Here was winter, still in the high snow drifts, in the bare trees, and in the dripping icicles; yet here was spring, showing through the snow. The icicles were melting and little puddles of water stood about the old black stove. The grass, like faded khaki, was streaked with faint yellow and green. The sunlight fell in brilliant splashes on the glass and snow. The workmen had thrown off their jackets and were without hats.

Somehow Joey's heart was not so heavy as he turned home at noon. Surely, with spring here, something would turn up. Farm work would begin, and there were lawns to mow, cleaning and painting to do. None of these did he want, though, as much as he wanted a job in a store.

In the late afternoon he again watched the men, while they carried out the last old boxes and worm eaten counters. Every box, every can, every package, was familiar to him. But they weren't his. After all, he had been foolish to put so much into another man's business. It was his own fault he was caught.

"Well, how er yu gettin' along, Joey? Found any work yet?"

Joey jumped. There stood John Hicks, a smile playing among the great wrinkles in his face. Humiliation spread over Joey's body and he trembled. Did Hicks mean to laugh at him, to his face? But Hicks was saying:

"How'd yu like to help us out a spell? We need an extra clerk and you'd oughta make a good one if anybody did. We'd give yu the same pay as we're givin' the others."

"I—I—thank you, John. I—I'll think it over, yep." Again he stammered bewildered, "Yes, thank you, I'd like to. That'd be just fine. Thank you."

"Well, come tomorrow at seven then. Glad tu have yu."

He was gone. Joey stared in bewildered confusion. What had he done? Was he, Joey Bean, actually going to work for John Hicks, the rival and enemy of long years, the man who had ruined his business and lost him his job? What terrible joke was this? Yet what could he do? If he didn't take the job he would surely starve. He went home, happier than he had been in weeks, yet bewildered and uncertain. Had he been wrong? Was John Hicks really a kindly old man? Perhaps he had been too serious about their little business rivalries to see a good man in his true light. Could he really have wanted Joey because he had run a store for years and was a good business man?

That night Joey could not sleep; he tossed, and he turned; he rose early and was at the store before seven.

He gazed in wonder at the old store, the hated old store. John had never bothered about a window display. One

could see right into the heart of the store from the sidewalk. The window counter was loaded with boxes, egg crates, oranges, wilted lettuce, everything. Joey had always been proud of his display in Sam's store. One day he had spent hours cutting strips of pale blue paper to twist and pin across the background with touches of dark red for contrast. On the counter everything had been arranged in a neat pattern with tablets, pencils, Post Toasties boxes, and sale soap as a color scheme. It had looked very nice. Sarah had thought so, too. This store was junky. But then, they didn't have time to bother with little things—they were so busy.

As Joey swept and carried and smiled and figured that day, a sense of peace gradually came over him. Everybody seemed pleasantly surprised to see him here. All his own old customers smiled and nodded. Once as he passed old Mrs. Gumbry, he heard her say,

"Well, I declare, I think it was just real nice of Mr. Hicks to give him a job. They can both help each other a lot."

After that his motions were even quicker. He wasn't too old yet, by a long sight. He could help John Hicks a lot and John, being a good businessman, had hired him.

In the back of the store John's boy, Elmer, said to John, "Dad, what on earth did you get that old fogy in here for? He's a terrible stall. Just in the way."

"Well, son," John lowered his voice. "He is a tarnation bother and sure in the way, but he's swell advertisin'." Then he laughed, "Havin' him here, people who used to go to him'll come here now. See. I'll keep him on a while—till I get the trade anyway; but he's too old to be much help."

Joey passed behind them into the little back harness room. His hands shook as he searched blindly among the bridles and bits, and again his thoughts returned to Sam Keeler's words, "Yer too old fer any good, Joey!"

Astronomy *In Parvo*

CURVIN H. GINGRICH

The Sun and Its Domain

THE fascination of the starry sky is immemorial and perennial. The primitive, untutored man of the past looked above him on a clear and moonless night with awe and wonder, not, in the least, comprehending what his eyes beheld. The enlightened, thoughtful man of the present feels the grandeur and the mystery of the universe, for, although the superficial perplexities of the savage have been removed, deeper and more puzzling questions ever present themselves and elicit consideration. To attempt to encompass the enormous reaches of space and time with which the science of astronomy has to do in its more general aspects would carry us very far afield. We shall then for the present content ourselves with a survey of our immediate spatial environment and with forming an acquaintance with our nearest astronomical neighbors.

If we were to follow our naive impressions we should doubtless conclude, as did the ancients, that the place we occupy is surely the center of the space in which we live. So clearly does the apparently hemispherical sky which arches above us suggest this to be the case that the conclusion is wellnigh irresistible. Did not they and do not we observe the stars and even the sun and moon pass over head from east to west, encircling us completely, from day to day? So convincing was the evidence that the earth was the center of all things, that the idea was formulated into the geocentric theory by one Ptolemy in the second century of our era. Later some observed motions made necessary certain modifications of the simple theory, so that by the time all the details were accounted for the theory had become quite complicated. However, no one had the temerity to question the validity of the Ptolemaic theory until Copernicus came upon the scene some thirteen centuries later.

Although the idea had been expressed from time to time by certain of the philosophers, notably Philolaus, Aristotle, and Aristarchus of Samos, that the observed phenomena would be as well represented by an earth rotating on its axis as by revolving heavens, it remained for Copernicus to insist upon it and bring it into prominence. Copernicus, moreover, pointed out also that the inconsistencies in the Ptolemaic system were removed by regarding the sun as the center around which those bodies, whose motions seemed irregular, were revolving. Indeed, the earth itself revolved around the sun, instead of the reverse as had been supposed. But even Copernicus did not go quite to the end. He, like his contemporaries, was dominated by the desire to ascribe perfection to the heavens. The circle was the perfect curve, therefore, so they reasoned, the paths which these bodies described around the sun must be circles. However, within the next century Kepler,

after studying most diligently the numerous and reliable observations of the Danish astronomer, Tycho Brahe, and others, deduced the law that the orbits of the wandering "stars", named planets because of their wandering, were not circles but rather ellipses, the sun being at one of the foci. The ellipse, studied two thousand years earlier as a mathematical abstraction, now was found by him to play a prominent and entirely unsuspected role in nature. A century later the great genius of Sir Isaac Newton pointed the way to still more sweeping generalizations. The law of gravitation, first stated by him, was seen to furnish the final link in the chain which connects the early, often erroneous, surmises with present exact knowledge. And the mechanism by which the sun is the controlling center in the region of space with which we are immediately concerned was clearly understood.

Although, as stated, the orbits of the planets about the sun are not exactly circles, nevertheless in an approximate representation of the sun and planets, the solar system, they may be regarded as such. Imagine, then, a portion of space, immersed in space as a whole, having roughly the shape of a grindstone, an ordinary watch, or the lens of a telescope. It is imporant that it be thought of neither as a very thin section, approximating a mathematical plane, nor as a volume extending to nearly the same distance in all directions from the center, approximating a sphere. The sun occupies the center of this lens-shaped portion of space and around it at various distances the several planets are unceasingly revolving. Moving out from the sun we cross the orbits of the planets in order as follows: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto. Between the orbit of Mars and that of Jupiter we cross the orbits of numerous small objects called asteroids or planetoids or, a more descriptive term, minor planets. At present more than a thousand of these orbits are completely defined and probably there are many thousands which await determination.

The planes of all these orbits pass through the sun and are inclined at small angles to each other, but all are included within a portion of space of the shape indicated. From the earth the unaided eye is able to recognize Mercury, Venus, Mars, Jupiter, and Saturn. Telescopes bring into view Uranus, Neptune, and Pluto, and some of the planetoids. The photographic plate reveals the presence of a great number of planetoids most of which are extremely faint.

Let us look a bit more closely at the individuals of this system. The sun is incomparably the largest and most significant. A faint conception of its size may be formed from a consideration of the following facts: the moon revolves around the earth at a mean distance of approximately 240,000 miles. Imagine the earth to be at the center of the sun and the moon to continue its revolutions as usual. In going from the earth to the moon in that setting one would travel only a little more than one-half the distance from the center of the sun to its surface. In other words the combined volume of one and one-third million earths would equal the volume of the sun. That it is the most significant body also is evident from a considera-

tion of the fact that all forms of energy are easily traceable to the sun and, consequently, without the benefit of the sun, life, as we know it, could not continue for any length of time. Moreover, the gravitational influence of the sun holds the system intact. That being removed, the individual planets would move on and on into the remote and inconceivably frigid regions of outer space.

Mercury, because of its relatively small orbit, is never very far to the west or to the east of the sun. Usually it is too near the sun to be visible, describing its diurnal course across the sky from east to west in the daytime. At certain periods in each year it may be seen for a few days near the western horizon just after sunset or near the eastern horizon just before sunrise. At such times it is easily visible to the unaided eye, although one must know the exact part of the sky in which it happens to be in order to find it.

Venus, because of its dazzling brilliance, at times, cannot fail to attract the notice of even the least interested person. At its brightest it exceeds all celestial objects, excepting only the sun and moon. Its orbit is such as to limit it also in the distance it may move east or west of the sun. However, it moves far enough east of the sun to remain above the western horizon some hours after sunset, and far enough west to attain considerable altitude in the eastern sky before sunrise. It can never be seen at midnight, but at times may be seen at mid-day even with the unaided eye. In size and other physical features Venus closely resembles the earth, so that the two are sometimes referred to as the twin planets.

Mars, since its orbit lies outside that of the earth, is sometimes in a position such that the earth is between it and the sun. At such times it is said to be at opposition. It will then cross the meridian at midnight and be in the most favorable position to be observed. At times it approaches the earth to within approximately 35,000,000 miles. More is known about its surface than about any other of the planets. An attempt to account for certain markings on its surface has led some to assert that there is intelligent life on Mars analagous to that on the earth. This is a point of very great popular interest and about which there is much speculation but no definite knowledge.

Jupiter is notable because of its enormous size. Its volume is about one thousand times that of the earth. To the unaided eye it appears as a very bright star, and in even a small telescope its disk is suggestive of the moon. On its disk certain semi-permanent markings called "belts" may be seen. They are thought to be clouds in the atmosphere of the planet. In a small telescope usually four of its moons are visible some on one side of the planet and some on the other as a rule and always having the appearance of beads on a string. These moons or satellites have played an important part in the development of several phases of astronomy.

Saturn, somewhat smaller and more remote than Jupiter, nevertheless possesses some characteristics which make it the most interesting of all the planets. Once seen in a telescope its system of

rings will always be remembered. The changing aspect of the rings from that in which a broad expanse of the surface is visible to that in which the edge is presented and the rings become invisible except in the largest telescopes furnishes a fascinating field for the professional astronomer and the amateur as well. Another interesting feature of this planet is that, if an ocean large enough to put it into could be found, it would float on the surface as a piece of cork.

Uranus, Neptune, and *Pluto,* the last having been discovered as recently as 1930, are very distant and very faint. Not much is known about them. One thing is sure, namely, that in their motions they obey very strictly the law of gravitation. Uranus was discovered by William Herschel more or less by accident. As for Neptune and Pluto, they were found after their existence and position had been predicted by mathematical theory, an accomplishment which constitutes perhaps the most dramatic event in the history of science.

Does this then complete the list of objects in the solar system? Well, no. Most of the planets have secondary bodies revolving around them of which the moon and the satellites of Jupiter, already mentioned, are typical examples. Then there are the comets, some of which move in comparatively small orbits around the sun and whose reappearance as to time and place can be predicted; others which appear unheralded, then disappear perhaps for a century, perhaps for a millennium, perhaps forever. And finally there are the countless millions of small particles of inorganic matter drifting through space in an entirely unorganized manner, some of which are continually encountering the earth's atmosphere, flashing out for a brief moment and commonly called "falling stars" or, more technically, meteors and meteorites. These bodies, then, quite varied in size and physical characteristics form the sun's family and are our neighbors.

The sun itself is a member of the family of stars. It seems different from the stars because of the mere circumstance that we are so near to it. Were we removed from it only as far as the farthest planet of the solar system the sun would appear not very different from the rest of the stars. The sun is 93 million miles away. After the sun the nearest star is 25 million miles away. Such are the distances in cosmic space. Do other stars also have systems of planets? We do not know. At the enormous distances of the stars, small objects such as planets, even if they are there, would be utterly undiscoverable. The imagination quickly suggests the thought that perhaps a story similar to the one we have just told about the sun might be told about each of the thousands of stars which under favorable conditions the eye discovers, of the millions of stars which the telescope discloses, of the billions which the photographic plate records, of the trillions and quadrillions which theory postulates.

But this question and many others equally alluring and equally baffling constitute astronomy *in magno.*

A Psychologist Looks at Education

PETER SANDIFORD

An eminent educator discusses some of the problems of modern education.

PSYCHOLOGY is still in its infancy. Not until late in the nineteenth century did it begin to discard the swaddling clothes of metaphysics and to stand on its own feet. But it is a lusty youngster and causes its quondam nurses to spend many sleepless nights. I said metaphysics with malice prepense, for it is with metaphysics, not philosophy, that the baby science has its quarrels. If one regards science as a pyramid based on mathematics, with successive layers composed of: (1) such subjects as physics and chemistry which are but one step removed from the absolute measures of mathematics; (2) such subjects as zoology and botany which deal with living things and are fundamentally more difficult to investigate than the non-living sciences of physics and chemistry; (3) such subjects as human biology and physiology which are still more difficult fields in which to experiment and are still farther removed from the mathematical base; (4) human psychology the most difficult of all the sciences, since experimental control is almost out of reach; and (5) philosophy, crowning all, whose major task is to synthesize the work of scientists in every field and show that all knowledge is one—a truly indissoluble unity, then psychology takes its place among the sciences and is seen to be somewhat closely related to philosophy.

When asked by the editor to give my views on a philosophy of education from the standpoint of an educational psychologist, I interpreted his request to mean that I had better take stock and write as clearly as words permitted me an account of the principles which guide my thoughts and practices in the educational world in which I live. Now stocktaking is usually regarded as a valuable exercise in the world of business. Whether or not this stocktaking, that the editor is demanding from a number of schoolmen of the North American continent, is going to be valuable in the world of education is uncertain, although the exercise is bound to be valuable to the individual who undertakes it. Perhaps it is somewhat presumptuous to call my small contribution a philosophy of education, but I can assure my readers that it is, at least, sincere.

With this introduction I may now begin my analysis of the problem. Having been reared in a world of science and having selected a field of study which has such traditional relationships with metaphysics, I first had to square myself between the two of them. My thinking has gone somewhat as follows: The world of experience can roughly be divided into two parts—a world of belief and a world of science. In the early days of man upon earth and, indeed, in the life of savages of today, belief was omnipotent, science non-existent. Belief, the older of the two, is based upon the more primitive part of our lives,

namely the emotions, and still has greater influence than science upon our behavior. Science is the newer, the more rational, and has made such strides that the gap between our social organizations (largely emotional and based upon beliefs) and our scientific discoveries bids fair to destroy present-day civilization. Belief, though irrational, is the more potent in action. My belief or disbelief in the immortality of the soul may be more effective in moulding the pattern of my life than all the science I know, but so far as is known at present, the problem cannot be subjected to scientific analysis and must forever remain within the circle of belief.

But many of the former beliefs of mankind have been put to crucial tests. For example Aristotle taught that "an iron ball of one hundred pounds falling from a height of one hundred cubits reaches the ground before a one-pound ball has fallen a single cubit." Galileo, on the contrary, claimed that weight had nothing to do with it, and that they would both reach the earth at the same moment. Let us read the account of the test of this belief as given by Namer, Galileo's biographer:

To hear such statements being made in the heart of so old and wise a city (Pisa) was intolerable, and it was considered urgently necessary to make a public exhibition of this young professor who thought so much of himself, and teach him a lesson in modesty that would last him the rest of his life.

Doctors with long velvet robes, and wardens who seemed to think they were going to a sort of village fair, left their various occupations and mingled with the representatives of the Faculty, ready to laugh at the scene no matter what the outcome might be.

Perhaps the strangest point in the whole story is that it never entered anyone's head to try the experiment for himself before reaching the arena. Daring to question anything that Aristotle had said was rank heresy in the eyes of university students at this period. It was an insult to their masters and to themselves, a disgrace that would cast them out of the society of the elite!

It is necessary to bear this attitude constantly in mind in order to appreciate more fully the genius of Galileo, his liberty of thought and his courage, and also to realize the profound slumber from which human consciousness had to be awakened. What efforts and agonies were necessary in order to give birth to an exact science.

Galileo climbed the steps of the Leaning Tower, holding himself well in hand in spite of the laughter and the booing of the crowd. He realized the solemnity of the hour. At the top of the Campanile he propounded the exact problem once again. If the falling bodies reached the ground at the same time he would have won his point; but should they arrive at separate moments, his adversaries would be in the right.

Everybody agreed to the terms of the dispute. They called for proofs.

The moment came. Galileo released the two balls of iron. All eyes were raised. A silence. The two balls were seen to leave together, stay together, and touch the earth together at the foot of the tower.

Thus was the science of experimental physics born. During the next century Chemistry was born of Alchemy, Astronomy of Astrology, and Medicine out of previous Quackery. But Psychology remained in the field of metaphysics—in the world of belief. The time was not ripe to erect it into a science. A sizeable piece, however, has been transferred from the field of belief to that of science. But some of it must forever remain outside the fold. For science demands experiment, repetition, the sharing of experience with others, and there is so much of one's experience that cannot be shared. How can I share my pleasure in music or a beautiful landscape with others? Such experiences can never be made to conform to the canons of science. This di-

vision of psychology—part science, part belief—makes for fundamentally differing philosophies among psychologists. And having been trained as a scientist my leanings are naturally strongly towards those who uphold the objective and experimental point of view. This attitude carries over into the field of education. I demand evidence and am very critical of unsupported statements.

The second thing that permeates all my educational thinking is the attitude I take to the vexed problem of heredity and environment. In fact, I suspect our attitude towards this problem divides us into opposing schools to a greater extent than we are prone to believe. For the problem is a basic one. When quite a young man, I wrote a book whose very first paragraph was captioned by the phrase "The Correlative Nature of Heredity and Environment." The phrase was new; the point of view almost unique. People at that time tended to divide themselves into hereditarians and environmentalists; few looked upon heredity and environment as correlatives. Yet this point of view is almost a commonplace today.

As I see it, the trouble so far as educators are concerned is due to the fact that education is part of our total environment. Educators are people who create special environments designed to cultivate (or kill) specific native traits. They see the immense changes in individuals and nations which can be made by means of education. In Russia and China enormous populations are made literate almost overnight. In Italy and Germany the young are turned into loyal Fascists or Nazis during their brief school careers. Organized education is undoubtedly a powerful weapon; profounder changes can be made in a shorter time by education than by any other means. No wonder we educators tend to look upon it as the universal solvent for all social ills.

Yet if we were farmers and adopted the purely environmental attitude towards the farm, we should land in bankruptcy even more quickly than the farmers seem to have done. We should pay great attention to the cultivation of our crops, to the housing and feeding of our stock, but we should utterly neglect the quality of the seed or the breeds of our animals. Any sensible farmer knows that he must pay attention to both factors—the hereditary qualities of seed and stock and the environmental care bestowed upon them.

The educator's difficulties lie in the fact that, unlike the farmer, he has no say in the selection of the hereditary element of his dual problem; he has to take all the pupils as they come. As a citizen, of course, he may have a voice in the control of the laws which say who shall become the parents of the next generation, but this power, even in California, has been exercised but to a very limited extent. What he usually does is not to worry about the kind of pupil being born, but to make the most of him when he arrives in school.

Some psychologists have even supported teachers in this attitude. They have said, in effect, give me any normal child and by a suitable training I will make him into anything you like—butcher or baker or candlestick-maker. The catch, of course, lies in the word normal. I suspect that even J. B. Watson himself would shy at the task of

making an imbecile into a psychologist. If history teaches anything, it is the fact that in the long run it is stock or breed that counts. Why has no historian given us a biological interpretation of history? Every other interpretation—the economic, the great man view, the common man view—has been given but nobody has worked out systematically the biological interpretation of historical events. By taking the long view we plump for breed, stock, heredity or whatever one cares to call it. But if we think of immediately achievable results we plump for education. And since teachers are concerned with immediately achievable results rather than long term improvements, they may be excused somewhat for taking the shorter viewpoint. In my opinion the sounder philosophy is to take both factors into account. As a teacher I know I cannot remake my pupils. If I could, I certainly would. I would make the stupid ones clever, the sickly ones healthy, the deaf to hear and the blind to see. Yet I try to remember that even the soundest and best of them may be irretrievably marred by any improper treatment I give them.

The environmentalist attitude of educators would be more soundly rooted if so-called acquired characters could be passed on to subsequent generations. Such direct transmission is still unproven and for all practical purposes may be assumed not to exist. The best that we can do is to pass on the improvements we have made in the environment. And this type of transmission, generally called social heredity, by easing the burdens of future creators of environment, is a more powerful factor than we have been wont to believe.

There is one very real contribution that psychology has made to the philosophy and to the practice of education. It has shown the diversity of the capacities and, therefore, of the needs that exist in different pupils. Formerly the curricula and the methods in schools assumed that individual differences were non-existent, that pupils were as much alike as peas in a pod, and, therefore, demanded the same kind of educational treatment. In the matter of diversity of curricular offerings American schools have apparently run amuck. They have mixed the findings of the psychologist and the economic materialist, and have tried to offer everything which would enable a child to earn a living. Some individuals undoubtedly earn a living in beauty parlors, so cosmetology was added to the curricula of many high schools and some colleges. Variety may be the spice of life to the psychologist, but cosmetology is certainly not one of his spices.

As a matter of fact the psychologist sees the child as an incessant and active learner. The older education looked upon him as averse to all kinds of learning. The child, therefore, must be driven and coerced. What is needed is an opportunity for healthy growth. Take into account, by all means, not only the different natures of children but also the different means by which they may be developed, but do not let economic considerations be the sole arbiter of the means. This leads to a mechanical job analysis and to the inexcusable waste of energy on the construction of a thousand and one curricula. Dewey, a gen-

eration ago, pointed out in his essay, "The Child and the Curriculum," that these were simply the two limits which defined a single process — education, and with this finding the psychologist is in hearty agreement; in fact it was Dewey the psychologist rather than Dewey the philosopher who was led to this conclusion. But Dewey, in his most ardent advocacy of variety of offerings, never contemplated the excesses in which curriculum making has indulged.

Compared with the major problems discussed above, the work of the psychologist in improving the techniques of instruction and in measuring its products, important as these undoubtedly have been, seem somewhat beside the mark. Too much insistence upon them has become an evil, since it prevents so many teachers from seeing the woods because of the trees.

It is not the duty of the psychologist to determine the aims of education, but he would like the teacher, who is a parent, to sit down quietly sometime and write out just what he would like his child to be and to become. As a parent as well as a psychologist, I should miss my guess if the first thing recorded was not health—that he wanted his child to be a healthy animal at every stage of his life. Yet how many schools of the past considered the maintenance or improvement of the health of its pupils as one of its prime duties? A second guess would be that the parent wished his child to be good but not goody-goody, to be a decent upright citizen in the community in which he lived. This is usually called character training and to the lasting shame of the psychologist, he is only now just beginning to study the ways and means by which character can be trained. These and other objectives may be set by the philosopher-parent; and when the problem is clearly defined the psychologist may be usefully called in to help.

From the standpoint of the psychologist, who knows the value of persistency of effort in overcoming obstacles, the chief failure in modern education, both traditional and progressive, is the failure to cultivate persistency. We have tried to make education "roses, roses all the way," yet no road that is worth travelling can either be a primrose path or one strewn with roses. Multitudinous short-time projects and activities, and courses of study improvised for a specific occasion without considering where they are leading, will not solve this problem of persistent effort. All too often it seems as if we expected our human plants to grow without a thought of the persistent yet varied attention which they inevitably demand. Had not Bagley this in mind when he reminded American schoolmen that what American education needs today more than anything else is a little tincture of iron? And if the psychologist through his studies of motivation, interest and effort can add his quota to the solution of this important problem, I shall feel that he has not labored in vain.

If time and space permitted, I should like to have elaborated some of the above points and to have added others. I can only ask the reader to consult the writings of psychologists and hope, probably in vain, that he will not become too confused by the offerings of

our various schools—purposive, gestalt, functional, psycho-analytical, behavioristic and the like. After which, he will probably tell me to put our own house in order, and synthesize our findings on a comprehensive philosophical basis, before daring to offer advice to others. And curiously enough, I shall take his verbal chastisement with due humility, for the more one tries to solve educational problems, the more insoluble they seem to become. But the persistent striving to solve them is extremely valuable; of that I feel absolutely certain.

Poem

DOROTHEA BOWEN

Now one by one my senses five
Become acutely more alive:
I see the breeze-born whispering;
Celestial track of angel wing
In air; see bird notes as they fall
And mountain echoes where they call.
I hear the growing of the grass,
And spirit footsteps as they pass
My way; sap's flowing under bark,
And now and then, approaching dark.
So also sense of smell be mine,
And light shall smell to me like wine
Of rarest vintage; and the glare
Of sun on leaves perfume the air.
Then shall I feel as few men feel
Soft flow of color near me steal;
My resting place shall be the roar
Of surf against the ocean's floor.
May I in turn taste flower tints?
Find savory the light that glints
On ocean's waves, and cloud's embrace,
And starry shadows out in space?
Ah, senses, opening time's text—
What follows you? What will be next?

Social Improvement

GUY V. PRICE

A sociologist discusses the new search for old values.

THE social crisis through which western countries are now passing has occasioned an examination of the maladjustments of contemporary society. Perhaps we are more conscious than ever of injustice, of exploitation, and of the inequitable sharing of the costs and benefits of civilization. The intellectual climate, the political discussions, the cleavages of opinion, have all been altered by a generation of new social ambitions and by the demands for social action.

On the other hand, present difficulties have led to a social nostalgia, a new search for old values, and a wish for a return of the spotty prosperity of the pre-depression days. The collapsing dykes of the older order have led to various defensive efforts. Some rely on the army; others expand propaganda to the point of adding greatly to mental fog and confusion; others devote themselves to a comparison of the old deal and the new. But no defense of the pre-depression order has been so indiscriminate as not to disclose wide areas of desirable improvement. The specter of reform and reconstruction cannot be dismissed by dogmatic arrogance or by electioneering tactics.

In this situation the writer has chosen to defend the thesis that western man has attained a degree of social development which has no historic parallel. This attainment rests partly in our business technology and our applied science, partly in our social values and in the institutions which in all western countries have had a special civilizing responsibility, and partly in our new perception of what might be. The cultural attainments of past civilizations—Greek, Roman, Medieval, Renaissance, Hindu, Chinese—need not be diminished, nor should the zeal for the improvement of our own be discouraged. But what is most needed is a recognition of the fact that our present civilization is so different from the social relationships prevailing in the past as to require a special and appropriate method of improvement.

The imposition of a Bolshevist synthesis on Europe and America is desired by some; others would go back to Adam Smith. But neither are appropriate to the present stage and neither could be instituted in wholesale fashion in any western country without disregarding a great part of the social development since the French and the American revolutions. Russian communism is not merely a mode of economic control; it is a civilization. Individualism has long been outmoded. It is not and could not have been the basis of any society short of anarchism. Its history is a history of continuous recession. Collectivistic nationalism, likewise, has been making such rapid headway that as Professor de Man has said, "To try to combat the economic nationalism of the present day by the classical arguments of Smith,

Bastiat, or Cobden is like trying to attack a tank with a sabre belonging to one of Napoleon's hussars." Similarly, Berle and Means, in their study, *The Modern Corporation and Private Property,* assert that, "The rise of the modern corporation has brought a concentration of economic power which can compete on equal terms with the modern state."

A method of reform that may satisfy the demands of a functional economics which liberates productive capacity by putting purchasing power into the hands of the majority millions, does not of necessity maintain cultural standards. The assumption of the Townsend Plan for old age pensions seems to reassert the old fallacy that it does not make any difference how we spend money just so we spend it. Social improvement must be both economic and broadly civilizing. The various forms of social reform today may be generously interpreted as an attempt to find a method of social advance which is appropriate and which can be applied experimentally. But many forms have stressed irrelevant features, such as suppression of intellectual freedom and one-sided doctrines of race egoism.

Prior to the world war, certain vigorous movements of social reform contained the promise of enhanced economic efficiency and of cultural development. President Theodore Roosevelt advocated in this country, as Lloyd George did in England, income and inheritance taxes; he gave approval to the creation of methods of popular control over party machinery, and issued a warning against those members of the judiciary "who had lagged behind in their understanding of the great and vital changes in the body politic." Until world revolution gained our attention, Woodrow Wilson was considered progressive. Professor Max Farrand thought so and declared that Wilson's first administration would probably long remain an unequalled record of legislative achievement, for which great credit must be given to Wilson himself. He succeeded in bringing about a reduction in tariff rates, revised the banking and currency systems and the anti-trust laws.

But writing in the *New Republic* (October 11, 1933), Max Lerner intimated that Wilson's methods were something in the nature of platitudinous phrases left over from an era when evil could be personally identified (despite Wilson's strong insistence as early as 1910 that the creation of corporations had changed the basis of social relations); whereas the bulletins issued by the present administration are an index of the agony of the capitalistic state. Yet Lerner concludes, "The New Freedom was more than a phrase of a college professor turned politician. It was a fleeting gleam of vision caught by a whole generation of the way of escape from the intolerable oppression of the vested interests."

Perhaps this vision was not so fleeting after all. It was not in Wilson's idea of reform to undertake governmental ownership of all the means of production and distribution. He was an outspoken enemy of regimentation. He believed in freedom, in responsibility, and in the value of competition as the regulator of prices. Yet his awareness of the evils associated with the rapid

rise of economic individualism led him to favor dissolution of the trusts as the only way to avoid socialism. Individualism, he saw, must be a well distributed individual benefit of modern economic production, and not a pseudo-collectivism with power centers beyond the reach of the voter, or the people might demand the genuine article. More fundamentally, however, his method was organic. He attempted to work with the maturing social convictions of his time and not futilely against them. For this reason, he vetoed the Volstead Act. He saw that political action forced beyond social conviction and incapable of being sustained by force brings inevitable reprisal and reversion.

It was part of these progressive movements to insist upon international trade. We are now told that the revival of world trade is a fantastic dream. Even Dean Wallace B. Donham contrasts national ideals and international idols. He says, "I believe the road to prosperity in the years ahead lies in making this nation as far as possible self-sufficient, in maintaining a proper balance between agriculture, mining, and manufacturing, and in supplying our own wants." But this is a depression statement. Such statements were not so common prior to the world war. It is true that international trade has fallen to a low estate compared with its pre-depression volume. Now that nations have stopped trading with each other they are making greater preparations for shooting each other. Such has been the nature of the military preparations as to involve, in the case of war, incalculable injury to the nations engaged and to the neutrals, if there are any, as well. In this decline of trade, living standards have fallen, thus showing that while nations are denying interdependence, its reality has been demonstrated.

The development of modern technology and social planning has tended to make nations more independent, but no conceivable cultivation of purely national resources can possibly sustain even the pre-depression standards of living, to say nothing of their advancement in America and in other countries. The line of social development therefore may be stated as that of greater economic efficiency and integration within the state, but with freedom of cultural development which makes possible continuous examination of the policies offered for our salvation. A pure collectivism does not state how social energy shall be distributed. It may overspend on pompous public civic structures to the relative neglect of proper housing; it may overspend on roads and neglect its schools. Between nations, greater freedom of trade and travel seems desirable, but the economic unification of the world and its anticipated political cooperation through a League of Nations must permit cultural differentiation. There is no point in dressing up if we have no place to go and no reason for stopping social improvement with provision for daily bread. It must expand to include all the capacities and aspirations of which we are capable. A functional economics liberates productive power through purchasing power of the majority millions, but it must also, in the interest of security, see that right things are consumed. Production and the general dis-

tribution of social energies are determined by our buying, both private and collective. This is a vote that is counted. The invigoration of consumer demand that is intelligent carries the promise of economic recovery and the hope of civilization, not by military heroics, but by the progressive fulfillment of needs.

Two Poems

YETZA GILLESPIE

I

O Wind, what sorrow bends your wings
To brush the harp-strings of the trees,
To improvise a thin lament
For things long lost in centuries?

Your murmured threnody is brief,
But every leaf cries old heart-break,
With terrible patience to endure
This grief, upraised in memory's sake.

If Eve still walked in wrinkled flesh,
In the weary mesh of bones and years,
Thus she would voice remembered woe,
And weep afresh,—if she had tears.

II

Men have wrought bravely here. Humbly, with awe
I wonder at the lifted pile of stones,
Like somber music, frozen beyond thaw,
Hollowed to sculleries, canopy for thrones.
Here rain and gust may rap their knuckles raw,
And winter break his teeth upon its bones.
Life, shod in velvet, walks a hundred halls,
Secure, within the miracle of walls.

These little men! A breath or two ago
Hunted into holes, shuddering in caves
With high, chill floors, the roof-tree pressing low,
But clear, a body's length, of grass that waves
In whisperings of death. Do they not know
Of tragic doors, of bitter architraves?
In memory thereof they boast in towers,
Fretted and carved with everlasting flowers.

How the River Shannon Was Named

ETHEL BOYCE PARSONS

THERE was once a maiden with a pretty face who wished above all things to be considered learned. Now such is the way of women that if she had been learned, her greatest desire would have been to possess a pretty face. But Sinend did not know that. She did know, however, that in the Land of Youth lies a certain well of knowledge, Connla's Well it is, and to it she determined to go and drink its waters.

So, rising at break of day one summer morn, she started through the dewy fields. When the sun was halfway up the sky, she came upon a stream bubbling into a pool glittering in the sun. And after she had drunk, she lingered on the marge and combed her golden hair, wishing all the time that she could change its hue at will and that some days when fancy suited her it would be flashing black like raven wing, and then her robes would be black as night without a moon or stars, and all who saw her would mark her lofty dignity. So she dreamed.

Then she became aware of a woman swathed in grey upon a stone. The woman gave her gentle greeting and Sinend saw that though her face was lined with sorrow, the brow was fresh with youth.

"Thou goest far?" the woman asked.

Sinend answered, toying with her locks, "I go to Connla's Well to taste of wisdom."

"In that case," said the woman kindly, "thou hast need of aid. Sit thee down here at my feet and I will tell thee of many men and women—yea, and of many nations—who have traveled this same path."

And Sinend thought, "Why should I tarry here with some old wrinkled hag?" But aloud she said, "Nay, though I do thank thee. I must reach the Well today, for tomorrow I dance at a great revel. Another time you may tell me tales."

So, humming a gay tune, she journeyed on.

Much later, as she made her way through a gloomy forest where the tangled trunks made mystic shadows on the moss, she beheld a shining thing which first she supposed a shaft of yellow light. As she approached, however, she found it was a page, clad like the sun in golden splendour.

"Sinend," he said while she gazed, admiring the richness of his attire, "I come from Lugh himself, *Ildanach* the all craftsman. He has a gift will help you on your path. Nay," he added quickly, seeing her eye upon his golden brooch, "'tis nothing of earthly treasure—something else, a spark of fire only."

But Sinend answered, "Nay, though I do thank him. The path is plain. I need no light, for I must reach the Well by dark. Tomorrow I dance at a great revel. Let me come another day."

Afternoon lay gold on the meadows when she stopped to rest beside a river. A swan drew near and spoke.

"Sinend," he said, "I come from Aengus Og, who awaits you at his palace on Boyne Water."

Sinend, watching her reflection on the wave and thinking if she could add some measure to her height her bearing would seem more noble, replied absently, "Aengus Og?"

"Thou and all know Aengus Og," returned the swan, "the god of love. Not," he added quickly, seeing Sinend's eye turn quick upon him, "not the foreign god of love goatlike piping in the rushes. The love of bird and beast and flower and grey ocean wave dwells in him and he weeps in secret for the sadness of the world."

Sinend turned back to her reflection wonderingly. "Now why should one weep for those he knows not? I have no wish to be unhappy looking on people's sorrows."

So in the scented dusk of evening she came to Connla's Well in Tir-na-n-og, the Land of the Ever Youthful. First she cried out in disappointment, for she had looked to see a splendid thing and lo, nothing but a quiet pool shaded by the hazel trees of wisdom. But as she peered into its depths, mystic figures came and passed and shrouded cities and processions of people and she knew not what it meant. Then suddenly on the hazels growing round the well new foliage burst into full leaf and in the same moment fruit and glimmering blossom fell in a shining shower through the purple dusk and surged in one great wave on Connla's Well.

Sinend stooped to drink, when from the depths of water came a voice.

"Sinend, hast thou spoken with the Grey Woman of the Past?"

And Sinend faltered, "Nay, I saw a woman on a stone but her name I know not."

"Hast thou learned skill in craft and received the spark to kindle dreary toil to flame?"

And Sinend answered, "I know not what you mean."

"Hast thou dwelt with Aengus Og and joyed in flower and bird and wept with him in secret for the world's unhappiness?"

The third time Sinend answered, "Nay."

"Then thou mayest never drink of Connla's Well, for of all these things you know not, is wisdom made."

And the wave surged up and overwhelmed the damsel and all her struggles proved vain. The angry waters tossed her up next morn on the shores of Erinn's mightiest river, which, since that time of the shadowy, legendary tribes that dwelt there before the sons of Miledh came, has borne her name in warning to the future that knowledge is a sacred thing cautiously to be attained—*Sionnan:* in English, *Shannon River.*

Coordinated Development in the Ozark Region

CONRAD H. HAMMAR

THE present depression caught the Ozark region of Missouri at a stage when the cream of its resources had been skimmed off and when many of its people had been living for a considerable period under continuous threat of poverty. This fact, together with the great severity of the economic decline, has given to many of the people of the region a depression psychology most notable in contrast to the courageous spirit of the pioneer who came into the region from the East and was responsible for such development as it has had. If the region is to have a renewed development, not only this attitude of near acceptance of defeat must be changed but an entirely new ideology must underlie the attitude of the Ozark's people toward the natural resources of the region.

There are perhaps few localities in the United States in which the decline of the region can so definitely be traced to the institutions of the people themselves as these have been expressed in their customary dealing with their natural resources. Perhaps, therefore, as a beginning it will be well to review these institutions and to assess their significance in relation to Ozark decline.

The first institution—the assumption that all land was agricultural land—has been a characteristic of most of those people who have been responsible for the development of the American continent and was not peculiar to Missourians. It persisted in the Ozarks despite the fact that the most prominent features of the land of that region is its stoniness and its steep and rugged contours. Evidence from the Census points to the fact that most of the land of the region has at one time or another been incorporated into farms or held by speculators for sale to people for development for agriculture. The persistence of this attitude right up to the present time has given the Ozarks a great number of poor farmers upon poor lands. The average fertility, as measured by surface soil nitrogen, per farm in the Ozark region, is approximately 230,000 pounds as contrasted to about 550,000 pounds per farm in northern and western Missouri. Indeed the idea that all Ozark land is farm land still brings vigorous letters of protest to the College of Agriculture objecting to the implied slight to Ozark agriculture that is inherent in the suggestion that the region be developed for forestry.

A second institution—that the forests will take care of themselves and need no management or development—has brought results even more deplorable. The region has been literally skinned of its timber until a negligible amount of virgin saw timber is left. The second growth has been culled time and again for logs of merchantable diameter, and

each year a large area of the forest floor beneath the second growth has been burned off so that an unusually high percentage of defective trees mar the value of the forest as it stands today. As a commercial asset Ozark forests at present attain only a small fraction of their potential productivity. In 1925 Missouri with twelve to sixteen million acres of land under forest cover produced less merchantable forest products than did the small state of New Hampshire with less than four million acres in forest lands. Recently, because of the rejuvenation of the wine and beer keg industry, there has been an increased activity in the harvesting of timber, particularly of the white oak. It is significant, however, that in the course of approximately two years a preponderant percentage of the merchantable white oak in an area as large as ten million acres covered with a dense oak forest could already have been cut.

A related institution has been—the presumption that continuous despoilation of land would not destroy its tax paying ability. Year after year the timber was cut, the brush, leaves and grass were burned, and practically no efforts were directed at instituting a genetic forestry or grazing. If prices for timber and farm products had continued to rise indefinitely, this attitude might not have met its doom in tax delinquency. With the contrary situation (a great decline in prices) delinquency has risen to an acute stage. In one county more than 80% of current taxes remained uncollected two months after the period, when they might last be paid without penalty, had arrived. In many Congressional townships of the region from 80 to 90% of the land area is delinquent and, more significantly, in these same townships often from 50 to 75% of the land is delinquent for two years or more, indicative of a decision on the part of the owners to cease paying taxes on these lands.

The attitude toward fish and game resources has been exactly the same as that toward forests and the land. Fish and game have been despoiled and ravaged not only by deliberate human ingenuity but even more significantly by human carelessness. The denudation of natural cover has increased the run-off so that streams which overflow at one season of the year now run dry at other seasons. It is the same rugged shortsightedness that has set fire to the woods in utter disregard of the effect that these fires have upon the cover and food and protection for upland game. As a result both fish and game are scarce in a region which should be noted for their abundance.

A further institution not so generally held, but much more cynical in its manifestations, has been that which assumed that the area could be sold to suckers indefinitely. In one of the hilliest, stoniest portions of the Ozarks an ambitious real estate operator divided whole townships into 20, 10, 5, and occasionally one acre tracts, and, with a great blast of advertising, was able to sell thousands of these to people in distant areas, chiefly, I am told, in the metropolitan centers. Today the costs of the ugly effects of this policy are borne by the people and taxpayers of the region. Literally thousands of these small descriptions are carried on the books of the tax collector as delinquent

for taxes and only an expensive legal proceeding will combine them so that they may again be recorded in official records in terms of major divisions such as the section. Rugged Carter County must, for instance, each year pay the cost of entering the notations of ownership upon the books of the assessor and collector because a cynical real estate operator over-sold the county.

The presumption that population would continue indefinitely to increase, the presumption that only the isolated-farm type of settlement was a proper one for an individualistic American, the presumption that there was no place for public ownership or for organized efforts at development, or conversely that private and individual effort must carry the whole load, and finally the more recent attitude which questions whether regions not excellent from an agricultural viewpoint were worth developing, have all been a part of Ozark ideology and account for certain aspects of its desolation and decline. On the other hand, there has been the genuine failure to comprehend that a region which could provide recreation, which could grow forests, which could be made to teem with game and fish, which has power, and mineral resources and which, less tangibly but not less significantly, can provide beauty, is just as well worth developing as an area noted chiefly for its abundant corn and fat hogs.

The matter of continued prosperity for the Ozarks is not one of indifference to Missouri. The state can very distinctly not afford to see these aspects of Ozark decline that have been mentioned continue. The Ozarks, including the Ozark Border area, occupy approximately a third of the entire land area of the state, and contain a population of between three and four hundred thousand. The rigorousness of this decline has not been uniform over this entire region but has affected much the greater portion of it. Rehabilitation and coordinated development for the Ozarks will involve a dual program directed, first, at the eradication of old institutions and second, designed to provide a definite program with a new ideology. There will, in other words, be involved at one and the same time the need for social discipline and particularly for a leadership sufficiently well-informed and sufficiently imaginative so that it can supply new ideas and new techniques that will impress Ozark people with their feasibility and practicability.

What should be the component parts of such a program? First and most painful there is likely to be necessary a shrinking of the agriculture of certain portions of the region. Lands that could be farmed successfully with corn at $1.50 and wheat at $2.00 a bushel and other prices in proportion can no longer be so used in an era when prices have sunk to only a fraction of that level. Indeed many of the farmers upon the stony land and even upon more level lands where these are underlaid by a tight impervious subsoil are more than willing to agree that their condition is desperate. Thousands of them are upon relief and in one county, Pulaski, located close to the center of the area, more than 25% of the people in the county were on relief during 1933.

Nevertheless, there will be potent and long drawn-out objections to any

program of shrinking agriculture. These objections will come from (1) those who have made a living advertising the excellence of Ozark lands and selling it to uninformed people for farmsteads, (2) public officials will legitimately suspect that the withdrawal of agriculture will mean lower assessed valuations and, hence, lower taxes, and (3) shipping and retail agencies that are dependent upon either the shipping of farm products or a clientele of farmer or rural customers will fear loss of transport tonnage and patronage. Only a positive program that has considerable promise of substituting a more profitable form of land use for agriculture will allay the fears of these groups. Many of these people, however, can be made to see that no amount of priming will keep the agricultural pump operating upon areas of naturally poor soils the small quantum of original fertility of which has already been worn down to the vanishing point. The abandoned fields of the Ozarks are too powerful a support of the contention that agriculture will need to be reduced for any but the most intransigeant to deny.

It is more easy to demonstrate the need for shrinking agriculture than to point out means whereby the people who are to abandon farming can find opportunity to enter into a satisfactory alternative occupation. After much thought those of us who have been most intimately concerned are convinced that the rehabilitation of these Ozark farmers by transplanting them to some other distant farming region or area presents impossible difficulties and the conclusion has been borne in upon us that the Ozark area can and should rehabilitate its own people. To accomplish this purpose it must first be related that the shrinkage of agriculture must by no means involve the abandoning of agriculture. Indeed, there is reason to believe that the total productivity of Ozark agriculture under some form of extensive land use such as grazing can for the long pull actually be increased rather than decreased. The recent introduction of acid tolerant legumes into the region strengthens this contention. Grazing, however, can be carried on only when acreages of land operated by each family are much larger than at present. There will be need, therefore, to provide alternative occupations for those who are displaced. The problem of making such provision constitutes the major difficulty in Ozark rehabilitation.

Three avenues of approach to the solution of this problem have been suggested. First and the most important, though likely to be delayed in its realization, is the proposal for a number of agro-industrial communities for the Ozark region. The prospect for the successful establishment of such communities is on the whole bright, because the Ozarks are a region in which undeveloped power and mineral resources, which will later be supplemented by abundant timber resources, abound. The Tennessee Valley authorities have already proposed for the eastern portion of their region a ceramics industry which, it is forecast, may employ as many as 25,000 people. Geologists and others tell us that the clay deposits in the Ozarks are among the best in the entire country. We may well, therefore, project a similar development in the Ozarks.

The undeveloped power resources of the Ozarks are gaining in state-wide and even national interests, according to H. C. Beckman of the U. S. Bureau of Geology who has compiled information that reveals that of the 700,000 horse power that are potentially available in the region only 234,000 have so far been harnessed.

For the agricultural part of this development it is proposed to make use of the subsistence homesteads or the part-time farming idea. While the Ozarks abound in poor land, there is also, along river and creek bottoms, much very good land. Members of the proposed agro-industrial communities may, therefore, live upon and use these better soils to produce much of their own food. Under such a regime they will not only need less industrial employment, but will, in the eyes of many, be able to lead happier and much better balanced lives than would be the case if they were specialized wholly either in factory work or in labor upon stony unfertile farms.

The second proposal runs in very similar terms, but is organized about forest-farm rather than agro-industrial communities. In Central European countries the forest-farm community has long been established and under the leadership of the Federal Forest Service, together with other interested groups in Washington, the establishment of similar communities in the Ozarks in the near future is a distinct probability. Ozark forests, because of the persistent burning to which they have been subjected, need an immense amount of sanitation, cutting, and silvicultural work done in them. The foresters are sanguine regarding the ultimately profitable outcome of expenditures made for such work and it is to be hoped that this forest rejuvenation work will provide, in part at least, a most happy immediate opportunity to put to work Ozark people who cannot otherwise be made self-supporting. This forest rehabilitation work can be carried on more effectively and expeditiously and can be made to contribute most to the reestablishment of proper living conditions for the people if these are congregated in compact part-time farming communities. It will be recognized in this connection that the customary isolated-farm type of settlement so dear not only to American farmers generally but to people in high official positions in the leadership of agriculture as well, will have to be violated if these forest-farm communities are established. We may well anticipate therefore some agony in defense of maintained Ozark individualism, poverty-stricken as that has undeniably become.

A third means of rehabilitation *in situ* is resident in the popularizing of the Ozark regions as a vacation and wilderness area. The recent report of the State Planning Board calls attention to the fact that within the Ozark region there is not only the world's largest spring, but in addition approximately seventy other springs large enough to flow a large volume of water continuously and surrounded with such scenic beauty as to be worthy of nation-wide interest. In addition there are thirty-six known and partly explored caves of unusual interest in the region. If to these can be added large bodies of impounded water necessary to the development of

power sites, and if the flora and fauna of the region are improved to the extent that has been found possible in similar regions in other states, there is no doubt but what the Ozarks may be made one of the most attractive vacation centers in the entire United States.

Other and more detailed aspects of this positive program of Ozark development might be brought to your attention. There is, for instance, the need for a much broader state program both with respect to forestry and game and fish rehabilitation to supplement that already inaugurated under the Federal Forest Service. There is the need for continuing land planning and the zoning of counties to curb inadvisable uses of land. There is need, also, for revision of laws relating to tax delinquency, and, quite as important as the above, there is the pressing need not only for the reform of the system of provision for education, but for a revising of the general governmental procedure as well.

Finally, it is perhaps worth saying that while fertile agricultural regions have played a role of transcendent importance in the development of the Middle West up to this time, there is every reason to believe that the new frontiers of development reside in areas that have just such a complement of natural resources as have the Missouri Ozarks.

1917

ELIJAH L. JACOBS

"I saw," he said, "a small French town
With red tile roofs and tall, slim trees.
A young girl wore a scarlet gown;
A hedge was murmuring with bees.

"Upon a stoop a red-combed cock
Crowed his defiance to the day.
An old man leaned upon a stock,
And limped and muttered on his way.

"A chimney spirted thin blue smoke
That mounted straight among the trees,
Until its slender column broke
And drifted slowly with the breeze.

"I passed the pleasant town; and then
I did not think of looking back.
When once I came that way again,
I saw heaped bricks, and beams burned black."

Physics and Modern Life

FRANK HOECKER

The Relation of Contemporary Physics to Modern Life.

TO those of us who yet retain our childhood love of fantasy and mysticism, Modern Physics has created a world in which our thoughts may wander unimpeded by the bonds of everyday, practical considerations. Within this world, Philosophy, Metaphysics and Physics mingle to form a design incomparably beautiful, yet so perfectly tenuous and, often, so abstract that final conclusions regarding its ultimate meaning are even today impossible. Nevertheless, no one, whether scientist or layman, is insensitive to the importance of this design for a fuller understanding of the world in which we live.

Whoever enters for the first time the domain Modern Physics has created, is at once impressed by the *apparently* complete lack of its reality in the familiar usage of this term. To the practical man, Modern Physics in its role as interpreter of phenomena with which only the physicist is acquainted seems to have lost all contact with the prosaic world in which he lives. In truth, this is not the case: Modern Physics, as a matter of fact, has come more and more closely into contact, not indeed with the superficial appearances of reality, but with reality itself. But, in so doing, it has been compelled to cast aside many cherished notions. Consequently, for the layman to follow the innumerable ramifications of the domain Modern Physics has created, it is necessary for him to re-examine his ideas of the world about him.

Two books, written by two eminent physicists for the general public, are indispensable guides to this re-examination. The one, *The New Background of Science,*[1] by Sir James Jeans, has a purpose distinct from that covered in any one of his well-known previous volumes:

> "I have tried to exhibit the new knowledge of Modern Physics in such a way that every reader can form his own judgment as to its philosophical implications. . . . I have not suppressed my own view that the final direction of change will probably be away from the materialism and strict determinism which characterized nineteenth century physics, toward something which will accord better with our everyday experience."

The other volume, *The Architecture of the Universe,*[2] by W. F. G. Swann, is this distinguished scientist's first book of a popular nature; it is intended primarily for the educated layman who has no special knowledge of physics or mathematics, but it is nevertheless interested in the broad features of the design of the physical world and particularly in the significance of man's endeavor to understand that design.

Both of these important contributions to a correlation of our knowledge of

1. New York: Macmillan, 1933. Pp. 301. $2.50.
2. New York: Macmillan, 1934. Pp. 428. $3.75.

the physical world are similar in nature and purpose, yet each has an individuality of style and point of view which deserves special consideration.

Jeans devotes the first part of his treatise to a critical contrast of the traditional and contemporary interpretations physics has given of the external world, and shows in a startlingly convincing manner how the ever increasing refinement of the instruments of research, as well as the constantly extended application of mathematical theory to physics, has revolutionized our concept of the structure of the universe. We no longer think of the phenomena of the universe as subject to the machinations of the gods, as was thought in ancient and medieval times; we no longer even think of it in the purely mechanistic terms of nineteenth century theorists such as Lord Kelvin, Maxwell, and Helmholtz; rather, as Jeans points out in the latter part of his work,

"We may say that present-day science is favourable to idealism. In brief, idealism has always maintained that, as the beginning of the road by which we explore nature is mental, the chances are that the end also will be mental. To this present-day science adds that, at the farthest point she has so far reached, much, and possibly all, that was not mental has disappeared, and nothing new has come in that is not mental. Yet who shall say what we may find awaiting us round the next corner?"

Jeans' extensive survey of the newest material of modern theoretical physics is as non-technical as is consistent with accuracy. There is nothing prosaic or plodding in his style. The layman will not be conscious of having been tutored, although much of the material may be new to him. Rather, he will find the book fascinatingly informative.

Swann, like Jeans, has written for the reader who is, for the most part, unfamiliar with mathematical symbolism, yet has a healthy intellectual curiosity concerning the most intriguing of the modern sciences—the physics of Einstein, Dirac, Heisenberg, and other contemporary theorists. Having allowed himself a greater space than Jeans, he has not limited himself exclusively to modern physical thought, but, working in a broader field, has endeavored to familiarize the general reading public, by means of analogy, with the more abstract concepts of the older physics which the modern takes as its point of departure.

Yet, his very wealth of detail has resulted in passages, often several pages in length, in which the vigor of his presentation falls to a much lower level than that of the greater portion of the book. The first chapter, particularly, is trying to the patience of a physicist, in that the author labors in a repetitious, pedestrian manner to forestall subsequent argument. It is to be regretted that the least interesting portion occurs at the beginning of the book, but, perhaps, that is necessary inasmuch as the reader must be introduced to unfamiliar material and prepared for the abstract philosophical problems following.

But, from the beginning of the second chapter, the beauty of the work unfolds, and continues to be more and more manifest as the author finds his stride, which reaches its highest poetic level in the discussion of Reality in Chapter IV. Surely he has blended the fascination of metaphysics with the beauty of poetry when he writes—

"For you who seek reality as something characteristic of certain concepts in physics as distinct from others will find that such reality is but a will-o'-the-wisp of philosophy. You may think you have it in your hand but to find that you have merely the shadow of something else. . . . Reality is the

most alluring of all courtesans, for she makes herself what you would have her at the moment; but she is no rock on which to anchor your soul, for her substance is of the stuff of shadows; she has no existence outside your own dreams and is oft no more than the reflection of your own thoughts shining upon the face of nature."

In his endeavor to use non-scientific terms to develop scientific ideas and in his avoidance of mathematical terminology, Swann is in reality translating from one language to another; more, he is translating ideas which are peculiar to a special language (for the expression of which that language was specifically developed) into another language which does not even have word equivalents and into which the ideas do not fit.

In spite of these difficulties, Swann has created a work in which the discriminating reader who seeks to broaden his interest in science may acquaint himself with the old as well as the new theories of Modern Physics. Jeans' style is more direct, more economical, more mature; consequently, it will appeal to the scientist as well as the layman. But the breadth of Swann's interest, expressed in a non-technical style, will undoubtedly appeal more to the general public.

The reader, of course, will not conclude that he has probed the entire field of physics when he has read these two books, which bear the same relation to the vast field of physics that a pocket camera picture bears to the gorgeous scenery of the mountains themselves. A certain spurious air of philosophical speculation has been injected by both writers in order to dramatize the material. Yet, in spite of the seemingly fantastic and revolutionary departure of Modern Physics from cherished traditions, there is actually nothing in the newer concepts which will destroy the highest values in human life.

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